

WHAT IS CLAIMED IS:

1. A method for upstream traffic control for data frames in association with a plurality of buffers including at least a first, a second and a third buffer with a
5 predetermined priority in transfer based upon service characteristic required in an Ethernet-based passive optical network, the method comprising the steps of:
 - (a) determining whether there is at least one data frame to transfer in the first buffer;
 - (b) if it is determined in step (a) that there is a data frame to transfer in the first
10 buffer, determining whether the data frame does not exceed a low water mark indicative of a reference value set up to ensure the minimum transfer traffic;
 - (c) if it is determined in step (b) that the data frame in the first buffer does not exceed the low water mark, transferring the data frame stored in the first buffer and determining whether the data frame in a second buffer does not exceed the low water
15 mark;
 - (d) if it is determined in step (c) that the data frame in the second buffer does not exceed the low water mark, then determining whether there is a data frame to transfer in a third buffer does not exceed the low water mark;
 - (e) if it is determined in step (d) that the data frame to transfer in the third buffer
20 does not exceed the low water mark, then transferring the respective data frames stored in the second and third buffers.
2. The method for upstream traffic control in Ethernet-based passive optical network according to claim 1, further comprising the step of checking a size of

data frames stored in the second and third buffers referring to the low water mark, and determining whether the transfer of the data frame is to be effected, if it is determined that there is no data frame to transfer in the first buffer in the step (a).

5 3. The method for upstream traffic control in Ethernet-based passive optical network according to claim 1, further comprising the step of transferring all the data frames stored in the first buffer, if it is determined that the data frame stored in the first buffer does exceed the low water mark in the step (b).

10 4. The method for upstream traffic control in Ethernet-based passive optical network according to claim 1, further comprising the steps of determining whether the data frame in the first buffer does not exceed the low water mark, if it is determined that the data frame stored in the second buffer does exceed the low water in the step (c), and transferring the data frames stored in the second buffer, if it is
15 determined that the data frame stored in the first buffer does not exceed the low water mark.

 5. The method for upstream traffic control in Ethernet-based passive optical network according to claim 4, further comprising the steps of first transferring
20 the data frames stored in the first buffer and then in the second buffer, if it is determined that the data frame stored in the first buffer does exceed the low water mark.

 6. The method for upstream traffic control in Ethernet-based passive optical network according to claim 1, further comprising the steps of determining

whether the data frame in the first buffer does not exceed the low water mark, if it is determined that the data frame stored in the third buffer does exceed the low water in the step (d), and transferring the data frame stored in the third buffer, if it is determined that the data frame stored in the first buffer does not exceed the low water mark.

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7. The method for upstream traffic control in Ethernet-based passive optical network according to claim 6, further comprising the step of first transferring the data frames stored in the first buffer and then in the third buffer, if it is determined that the data frame stored in the first buffer does exceed the low water.

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8. The method for upstream traffic control in Ethernet-based passive optical network according to claim 1, wherein the data frames stored in the first buffer include video data frames, the data frames stored in the second buffer include audio data frames, and the data frames stored in the third buffer include character data frame.

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9. The method for upstream traffic control in Ethernet-based passive optical network according to claim 1, wherein in the course of transferring the data frames stored in the second and/or third buffer, if the data frame in the first buffer does exceed the low water mark, then transferring of the data frames stored in the second
20 and/or third buffer is interrupted and a transfer of the data frame stored in the first buffer with highest priority is effected.